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FOOD AND HEALTH: PROMOTING THE IMPORTANCE OF MAINTAINING A
HEALTHY DIET TO MINIMIZE DISEASE IN INDIVIDUALS AT GREATEST RISK

by

NADJIA EDWARDS

©

SYNTHESIS*

MASTER OF ARTS

CRITICAL AND CREATIVE THINKING

UNIVERSITY OF MASSACHUSETTS BOSTON

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Advisor: Robert Ricketts

* The Synthesis can take a variety of forms, from a position paper to curriculum or professional development workshop to an original contribution in the creative arts or writing. The expectation is that students use their Synthesis to show how they have integrated knowledge, tools, experience, and support gained in the program so as to prepare themselves to be constructive, reflective agents of change in work, education, social movements, science, creative arts, or other endeavors.

ABSTRACT

Diets high in calories, saturated fats, sodium, and added sugars can lead to adverse health events such as; heart disease, diabetes, obesity, high blood pressure, stroke, osteoporosis, and certain cancers. Maintaining a healthy diet can help decrease this potential, but those experiencing food insecurity remain at risk as they may have challenges accessing and affording healthier items. Quality may be sacrificed for quantity leading to the purchasing of food that increases these health risks. Initiatives have been developed to address these obstacles, but aren't widely utilized. This underuse can be due to a lack of emphasis on the importance of selecting healthier options. This synthesis seeks to provide as much relevant information as possible to promote a better understanding of food insecurity, how food insecurity is affecting individuals in the Massachusetts area, and the effects it can have on being able to maintain a healthy diet. Interventions were also developed to help those experiencing food insecurity begin improving their health with the use of food.

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Problem Definition

Many factors affect a persons' health risks and their outcomes. These factors can range from access to social and economic opportunities, "the resources and supports available in homes, neighborhoods, and communities; the quality of schooling; the safety of workplaces; the cleanliness of water, food and air; and the nature of social interactions and relationships" (Healthy People 2020). We "learn" about health in our home, school, workplace, neighborhood, and community, but there still seems to be a disconnect between the information provided and how it is used.

According to the Centers for Disease Control and Prevention (CDC); fewer than 1 in 10 adults and adolescents eat enough fruits and vegetables, 9 in 10 Americans 2 years or older have more than the recommended amount of sodium, and 6 in 10 people ages 2 to 19 and 5 in 10 adults have a sugary drink on a given day. Issues, such as obesity, which currently costs the United States health care system \$147 billion a year, can persist and worsen if one continues to consume large amounts of unhealthy fattening foods (NCCDPHP, 2019).

Research has shown that a diet high in calories, saturated fats, sodium, and added sugars can lead to increased risks of heart disease, diabetes, obesity, high blood pressure, stroke, osteoporosis, and certain cancers (CSPI, 2016). In 2017, heart disease was the number one cause of death in the United States, totaling 23.5% of total deaths. The primary way to reduce the risk of dying from heart disease is to protect your heart through a healthy diet and regular exercise. Diabetes was the seventh cause of death in the United States. While type 1 diabetes is not preventable, type 2 diabetes can be prevented by avoiding a sugar-rich diet and an inactive lifestyle (Nichols, 2019).

Diet can also increase the level of vulnerability to viruses and bacterial infections. Currently, those with chronic health conditions are being most affected by the COVID-19

pandemic. The Centers for Disease Control and Prevention conducted a study of about 1,500 hospitalized patients in 14 states during March; California, Colorado, Connecticut, Georgia, Iowa, Maryland, Michigan, Minnesota, New Mexico, New York, Ohio, Oregon, Tennessee, and Utah. They calculated that 89% of people hospitalized for COVID had at least one chronic condition, with 50% having high blood pressure, 48% experiencing obesity, 35% having chronic lung disease, and 28% having diabetes and cardiovascular disease (Garg et al., 2020).

While it is crucial for all Americans to maintain a healthy diet to minimize their potential risks of getting these diseases, some will be more able than others to make dietary changes. A significant factor in being able to maintain a healthy diet is access to clean and healthy foods, food security. Food security is the immediate access by all people at all times to enough food for leading an active, healthy life. A person is considered food secure if they have at minimum: the ready availability of nutritionally adequate and safe foods and an assured ability to acquire acceptable foods in socially acceptable ways (Cook and Frank, 2008). Those experiencing lower levels of food security, can be affected by multiple peripheral issues that limit their availability and ability to acquire healthy foods; such as lack of access lack of affordable housing, social isolation, chronic or acute health problems, high medical costs, and low wages (Hunger +Health, 2019). While addressing all of these factors is necessary for decreasing potential health risks and improving outcomes of those suffering from food insecurity, this involves multiple stakeholders, resources, and time. For this synthesis, I will be focusing on how lack of access can limit availability and ability to acquire healthy foods and will be providing readers with as much relevant information as possible so that they can better understand what food insecurity is, how food insecurity is affecting individuals in the Massachusetts area, and the effects it can have on

being able to maintain a healthy diet while piloting interventions to help those experiencing food insecurity understand how to begin improving their health with the help of food.

Personal Connection

In 2009 I was diagnosed with ulcerative colitis, a chronic disease of the large intestine where the colon lining gets inflamed and forms open sores and ulcers due to an overactive response in my immune system (Crohn's & colitis foundation, 2019). This diagnosis allowed me to gain a first-hand understanding of how food can have a negative or positive impact on health. For years after being diagnosed, I always had disease like symptoms, leading to flares of my condition where I was placed on steroids. Being on steroids caused me to gain a lot of weight, and it affected how certain foods were digested. Granted, a majority of the food I was eating was highly processed, fatty, sugary, and full of sodium. I even had to be tested for diabetes because the steroids would increase my blood sugar levels. I did not think there was a connection between my flares and my diet until 2018, when I was hospitalized as steroids were not working to minimize my flare. During my hospital stay, I had a nurse that asked certain foods caused me to experience disease symptoms. No doctor had ever talked about food affecting my ulcerative colitis; they just adjusted my medications. After this experience, I started researching more on how food could be used in my disease management.

60 - 80% of the immune system is within the gastrointestinal system, meaning your stomach and colon. The nutrients in foods are “are essential for the growth, development, and maintenance of body function” (Denton, 2016). When the body is not receiving its nutrient need, the process of turning food into energy can slow or even stop. Packaged and processed foods that taste good in the moment can compromise our nutrition as most of these have additives, artificial color, flavorings, bad fats, and sweeteners. It took me almost ten years to learn that I was not

providing my body with the food it needed to thrive. After finally understanding this, I decided to start changing my diet, which was not an easy task. I tried different diets, such as veganism and keto, but I had to complete research on how to follow those diets properly. Some sources were more challenging to understand than others, and there were so many websites, books, podcasts, to sort through. If someone didn't have the time or energy to devote to this research, they may not even bother with it. In time, I also had access to the healthy and fresh foods that are allowed with these diets. And lastly, I had the support from my family to change their eating habits along with me. Not everyone can do this.

Having the ability to start living healthier is currently a privilege, and it made me think to my current work on a study for critical limb ischemia. This disease occurs when there is low blood flow to the legs causing rest pain, swelling, ulcers, and feet discoloration. The leading causes of critical limb ischemia are obesity, diabetes, and smoking, factors which can be minimized with the improvement of diet. Many of the sites running the study are in lower-income areas, and I wondered why that was the case. This inquiry led me to researching food insecurity and understanding the detriments those experiencing this insecurity can face.

Definition of Food Insecurity

Understanding food insecurity is necessary when learning what impacts health and access to food. When one is experiencing food insecurity, at times during the year, eating patterns may be disrupted, and food intake may be reduced due to lack of money or other resources. When a household is at severe levels of insecurity, they may decide to sacrifice quality for quantity to prevent family members from feeling hungry. Due to this, "inexpensive energy-dense foods" may be purchased more frequently. These can contain large amounts of starches, sugar, salt, and fats, causing a person to feel full after eating them, but lack nutritional value (Cook and Frank,

2008). The United States Department of Agriculture developed an economic research report for household food security in the United States in 2018. It determined that an estimated 1 in 9 Americans or 37 million people were food insecure (Hunger +Health, 2019).

Research has shown that low-income neighborhoods are supplied with fewer supermarkets, placing many of these neighborhoods in the category of a food desert. In urban settings, a food desert is an area that does not have “ready access to a store with fresh and nutritious food options within one mile.” In rural settings, a food desert is an area that does not have “ready access to a store with fresh and nutritious food options within 10 miles or more” (Move for Hunger, 2017). In low-income communities, it is rare to find a full-service grocery store, farmers’ market, and other vendors selling fresh fruits, vegetables, and other healthy foods. Unavailability of healthy food items started in the 1960s and 1970s when white, middle-class families moved from urban centers to the suburbs, and supermarkets went with them. With this, the stores now found in low-income communities are typically convenience stores and fast food restaurants. These options mainly sell “cheap, high-fat, high-sugar, processed foods”, making it difficult to maintain a nutritious diet (Karpyn and Treuhaft, 2010).

In 2009 the U.S. Department of Agriculture ran a study that determined 23.5 million people did not have access to a supermarket within one mile of their home. 113 out of the 132 studies reviewed demonstrated that “people living in low-income neighborhoods, minority neighborhoods, and rural communities face much greater challenges finding healthy food, especially those who lack good transportation options to reach full-service grocery stores.” A reason is because there are fewer supermarkets and more convenience or small grocery stores in these areas. “Low-income areas have 25% fewer chain supermarkets and 1.3 times as many convenience stores compared to middle-income areas”. While low-income areas have

convenience stores and small grocery stores, there is a disparity in the amount of healthy food available in these stores. Twenty-one studies reviewed found that food stores in lower-income neighborhoods were “less likely to stock healthy foods, offered lower quality items, and had higher prices compared to higher-income communities” (Karpyn and Treuhaft, 2010).

Access to grocery stores also affects the ability to eat healthier. In a study of more than 10,000 adults, *The Grocery Gap: Who Has Access to Healthy Food and Why it Matters*, found that adults who live in neighborhoods with supermarkets or supermarkets and grocery stores have the lowest rates of obesity, 21%, and overweight 60 – 62%. But those who live in areas with no supermarkets and only convenience stores, smaller grocery stores, or both had the highest rates of obesity, 32 – 40%, and overweight, 73 – 78% ((Karpyn and Treuhaft, 18, 2010). Households can have harder times meeting the recommended dietary guidelines for good health, which includes eating enough fruits and vegetables and lowering fat intake, when they do not have nearby access to healthy ingredients.

Food Insecurity in Massachusetts

I will be focusing on food insecurity in Massachusetts, specifically Boston, because I was born and raised here and therefore, may be more readily equipped to identify avenues through which I might directly impact my community. Since 2010, the number of families with young children in Massachusetts who would be considered food insecure has greatly increased. A study conducted by Children’s HealthWatch and the Greater Boston Food Bank in 2018 confirmed that hunger and food insecurity in Massachusetts increased health-related costs by \$2.4 billion in 2016 alone (MPHA, 2020).

A data analysis by The Food Trust, a nationally recognized health-oriented nonprofit, from 2017 confirmed that 2.8 million out of 6.9 million people living in low-income areas in

Massachusetts, “defined as incomes lower than the statewide per capital income level of \$36,895”, lack access to grocery stores (MPHA, 2020). Out of those 2.8 million people living in low-income areas, 616,090 people were struggling with hunger, 159,950 of them children (Feeding America, 2020). The map below shows which areas in Massachusetts are both low income and have limited grocery stores. The grocery stores included in this data are supermarkets, supercenters, and mid-size grocery stores that have annual sale volumes of \$2 million or more. In many of these areas, residents are less able to afford travel to ones that do have stores. Due to the lack of available stores, residents are suffering from high rates of obesity, diabetes, and other diet-related diseases. There is also a lack of economic revitalization and quality jobs that grocery stores typically provide (MPHA, 2020).

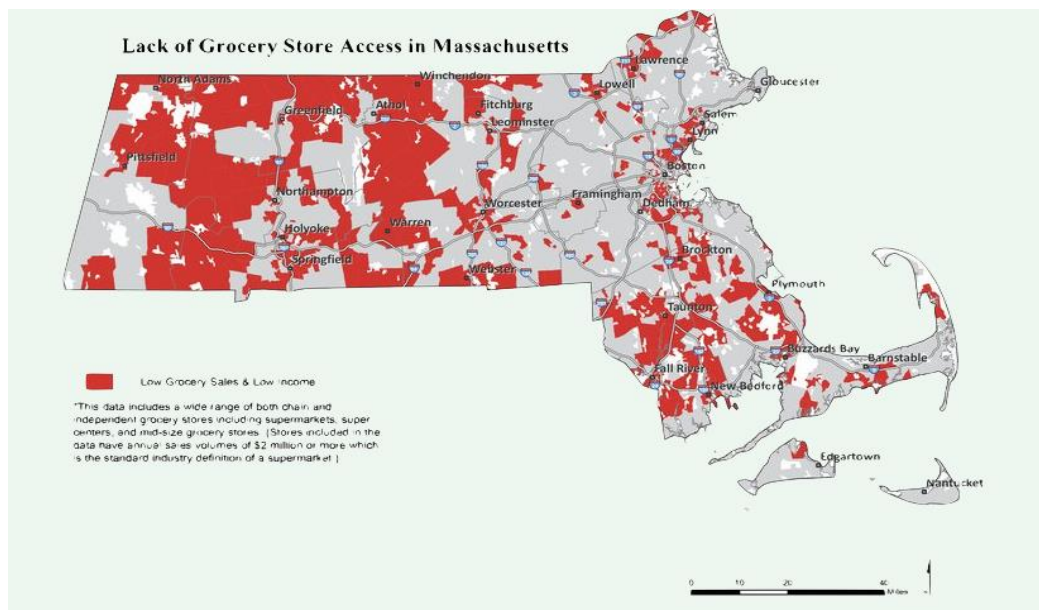


Figure 1. Lack of Grocery Store Access in MA (Kimani, 2020)

In comparison, the average food insecurity rate in Boston is 18% of people or 125,024 out of the 694,583 population (Boston Population, 2020).

Food Insecurity Rate by Neighborhood

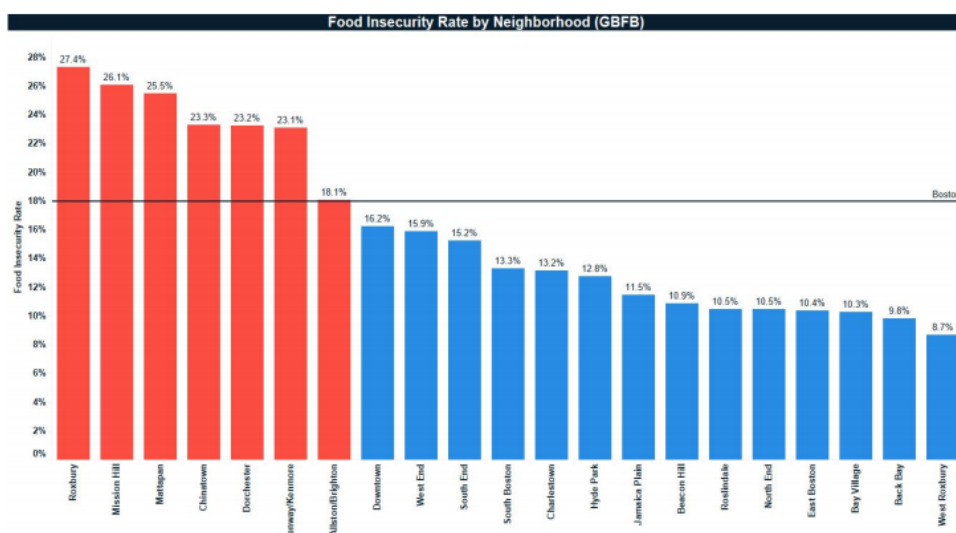


Figure 2. Food Insecurity Rate by Boston Neighborhood (Pineda, 2019)

This graph above comes from Boston Mayor's Food Access Agenda 2019 – 2021 and shows the rate of food insecurity by Boston neighborhood. Roxbury is the highest with a 27.4% food insecurity rate, followed by Mission Hill at 26.1% and Mattapan at 25.5%. These areas have been historically lower-income communities with a highly multicultural population. Leading us to ask what are the most urgent factors contributing to these percentages?

The first factor is affordability. Healthy foods tend to be more expensive than healthier options because fresh foods are not subsidized the same way. Harvard School of Public Health ran a study in 2013 and concluded that eating a diet rich in fruits, vegetables, fish and nuts cost \$1.50 more per day than someone eating a diet full of processed foods and refined grains, totaling an extra \$2,200 per year for a family of four. Also, the cheaper, processed, sugary, and salty foods last longer and are more available in low-income communities. The second factor is accessibility, which can include transportation. In Boston, the MBTA subway and bus system can be unreliable or difficult to navigate with bags of groceries. Families may have to take multiple bus lines to a grocery store that has affordable and culturally-appropriate foods. With all

this potential transportation, families have to budget this into their shopping. But accessibility can also include access to food benefits. Someone may not be able to access food services due to their primary language, a disability, education, immigrant status, or not fitting the criteria for a program but still struggling to afford food (Pineda, 2019). Affordability and accessibility are factors increasing levels of food insecurity seen in Boston and Massachusetts.

What is currently being done to address food insecurity in MA?

Massachusetts and Boston have implemented initiatives to address the first factor of affordability. Food stamps, now renamed to the Supplemental Nutrition Assistance Program (SNAP), began in the United States in the late 1930s and became a nationwide entitlement program in 1971. SNAP provides temporary help by providing supplemental money to buy food until people can get back on their feet. Only Massachusetts residents can receive SNAP benefits, and either have a current bank balance, savings and checking combined, of \$2,001 or have a current bank balance under \$3,001 if they share their household with someone 60 years and older, or a person with a disability. Equaling a maximum income level of \$24,980 before taxes (Benefits.gov, 2020). According to Feeding America, in 2020 “31.3% of households receiving SNAP benefits have children” (Feeding America, 2020).

The Healthy Incentives Program was established to aid in the increasing of buying power. The Massachusetts Department of Transitional Assistance administers this program. It provides a “100 percent incentive – a dollar-for-dollar match – for each SNAP dollar spent on targeted fruits and vegetables purchased at participating farmers markets, farm stands, mobile markets, and Community Supported Agriculture programs statewide”. This will be credited right back in a persons’ SNAP account for them to use right away or save. In Boston, the *Boston Double Up Food Bucks* program is another incentive program that gives a dollar-to-dollar match

up to \$10 a day if someone purchases fresh fruits and vegetables with their EBT card at participating corner and grocery stores.

Another initiative is *The Massachusetts Food Trust Program* (MFTP), which launched October 30, 2018. This program works to “provide loans, grants, and business assistance to support new and expanding health food retailers and local food enterprises in low and moderate-income communities, to increase access to healthy foods and spur economic development.” The goal of this program is to increase access to healthy, affordable food in low-income, suburban, and rural communities. The program also emphasizes businesses producing, promoting, and selling food that is grown, caught, or harvested in Massachusetts. The program helps to launch and expand business while creating jobs and increasing economic opportunities in these areas. This outcome has also been observed in the Pennsylvania Fresh Food Financing Initiative.

This initiative was established in 2004 to overcome the barriers to healthy food retail development being experienced in Pennsylvania. The Commonwealth of Pennsylvania, The Food Trust, The Reinvestment Fund and the Urban Affairs Coalition developed the Pennsylvania Fresh Food Financing Initiative, which helped establish supermarkets and fresh food outlets in 78 underserved urban and rural areas. The initiative helped to increase access to healthy food for about 500,000 residents. The initiative also created 4,860 jobs throughout the state and 75% of those jobs were filled by residents who lived within 3 miles (Karpyn and Treuhaft, 2010, pg. 20). The program ended in June of 2010 due to minimal state funds allowing lack of access to healthy food continue to have a negative effect on Pennsylvanians in lower-income communities (Norris, 2012). Hopefully, the MFTP will not have this issue as the amount and type of financing will depend on the availability of funds at the time of a program application, the borrower’s need, and the project’s size and expected impact (Espinoza and Waite, 2019).

To be eligible for the MFTP, the project must “increase access to nutritious food in under-resourced neighborhoods and fit local community needs.” Projects can either be the development, renovation, or expansion of: grocery stores, corner stores, co-ops, farmers’ markets, food hubs, community kitchens, or urban agriculture. On May 29, 2019 the MFTP announced its first awards made to seven healthy food projects representing Berkshire, Bristol, Franklin, Hampden, Plymouth, and Suffolk counties. The programs include two grocery store expansions, a food co-op, a greenhouse, an urban farm stand, a youth apprentice program, and a project aimed at increasing produce distribution networks for corner stores (Espinoza and Waite, 2019).

To help address affordability issues that Massachusetts students may be facing, The Massachusetts Department of Elementary and Secondary Education established the National School Lunch Program in 1946 under the National School Lunch Act, which is still in effect today. The National School Lunch Program receives federal assistance and provides nutritionally balanced, low cost or free lunches to over 26 million children. With this program, school districts can provide lunches that meet Federal nutrition requirements at free or reduced-price to eligible students (Office for Food and Nutrition Programs, 2019).

The second factor of accessibility has been addressed in Massachusetts but specifically Boston, Massachusetts, through the implementation of various programs. To ensure Massachusetts schools were serving healthy options, the “Act Relative to School Nutrition” was signed into law on July 30, 2010. This act required the Massachusetts Department of Public Health to establish standards for competitive foods and beverages sold or provided in public schools during the day. Competitive foods are foods and beverages sold in a la carte lines, vending machines and school stores. These typically “compete” with school meals. These items

are readily available but are energy-dense and of poor nutritional quality. The goal was to ensure schools offer students food and beverage choices that “enhance learning, contribute to their healthy growth and development, and cultivate life-long healthy eating behaviors” (Gorski et al., 2016). The “Act Relative to School Nutrition” was enacted to help reduce childhood obesity and prevent the complications of obesity in childhood and adulthood.

Food and beverage standards were set and included:

1. Making water available to all students during the day without charge
2. Selling fresh fruits and vegetables wherever food is sold, except in non-refrigerated vending machines
3. Prohibiting the use of fryolators for competitive foods
4. And by August 1, 2013 nutrition information needed to be available for non-prepackaged competitive foods and beverages served in the cafeteria

In Boston, Massachusetts, Mayor Marty Walsh’s Office of Food Access has developed programs, services, and initiatives to ensure everyone has access to nutritious foods. *The Boston Summer Eats Program* was developed to provide “free and nutritious meals to youth ages 18 and under at more than 100 locations throughout Boston”. This program is working to reduce food insecurity in children in Boston by ensuring they do not go hungry during the summer months when school is out. Many students rely on school meals for a portion of their food access and that gets decreased when school is not in session. The locations are supported and managed by the Mayor’s Office of Food Access and are funded by the Boston Children’s Hospital Collaboration for Community Health. During the summer of 2018, *The Boston Summer Eats Program* served over 18,500 meals.

The Mayor's Office of Food Access has also developed *Food Resource Maps* that show "free, low-cost, and emergency food outlets including: food pantries and meal sites, affordable fresh fruit and vegetable sources, senior dining sites, farmers market locations, and SNAP enrollment assistance locations, as well as other general information." The map can be organized by neighborhood or by the specific resource and comes in five different languages; English, Spanish, Chinese, Haitian Creole, Russian and Vietnamese.

The *BOSFoodLove* program was developed to ensure that Boston Public Schools students love the school food. Close to three-quarters of Boston Public Schools students live at or below poverty however, only 40% participate in school breakfast and 68% in school lunch. And it has been seen that at the end of meals there are garbage cans full of uneaten food. *BOSFoodLove* works with students and parents to get input on the school food programs to ensure students have access to "free, healthy food that meets their dietary needs and preferences and supports their ability to perform well in school."

Urban farming has also been a focus for improving access to healthy food. In 2013, Boston passed Article 89 in the Boston Zoning Code to support commercial urban farming in the city. This was done because urban farming provides residents better access to fresh, healthy, and affordable foods while cutting transportation costs and carbon emissions. The Mayor's Office of Food Access works to help farmers "expand their business to stores and farmers' markets, making farming a profitable profession" (The Mayor's Office of Food Access, 2019).

While these programs can significantly help individuals overcome the barriers of being able to access healthy food options, many are underused, but why? The Mayor's Office of Food Access is attributing this to a lack of public awareness, misunderstanding of the eligibility criteria, or fear of associated stigma for using these programs. I would add that lack of nutrition

education, and an inadequate understanding of the vital role diet plays in improving and maintaining health is a contributing factor to the underuse of food access programs.

Why is there a Gap?

Across the United States, “improving neighborhood access to high-quality grocery stores is responsible for just 5% of the difference in nutritional choices between high-income and low-income families. Instead, its unequal access to education – particularly food and nutrition education – that accounts for most of that disparity”. The solution is not just improving access but providing better educational opportunities (Doyle, 2018). While Massachusetts and Boston, specifically, have made great strides to improve access to healthy foods, I had difficulty finding programs focused on informing the general public about the importance of maintaining a healthy diet. “Knowledge is one of the factors necessary for the change in dietary habits”, and without it, the current programs focused on improving access to healthy foods will not be as successful as they could be.

Instead, I began exploring what was being taught to the students of Boston. Students, especially those in High School, start to “take over the responsibility for their own eating habits, health attitudes and behaviors...this can lead to poor health profile, including poor diets and eating habits” (Milosavljević, 2015). It is crucial to ensure that students are receiving an education that will promote healthy diets because they can have trouble “thinking about the future and how actions of today will affect future outcomes” (Croll, 2001), such as obesity, heart disease, and diabetes.

One group that is working on the improvement of education in students is *FoodCorps*. They are working to create a future in which all children know “what healthy food is, care where it comes from, and eat it every day” (FoodCorps, 2019). Not all students have access to healthy

food or education that focuses on the importance of a healthy diet and how to make healthy choices.

FoodCorps service members developed hands-on lessons by working with educators to “teach cooking, gardening, and tasting, since kids love foods they have grown and prepared themselves”. They also work with cafeteria staff to “create a cafeteria that steers students towards the healthiest options and gets them excited to try new healthy foods.” And lastly, they create a schoolwide culture of health by getting the “school community – from principals to the hallways to the bake sales – to celebrate healthy food” (FoodCorps, 2019).

FoodCorps offers programs in Massachusetts, specifically regions of Boston, Greater Boston, the North Shore, and Hamden County. The services *FoodCorps* provides include “conducting a cooking class with a group of 2nd graders, designing lessons on the food system for an after-school club, offering a school-wide taste test, or inspiring teachers to bring their students to the school garden” (FoodCorps, 2019).

While programs like *FoodCorps* are working to help improve this food and nutrition education gap, I still needed to learn about the current food and nutrition education directly from the source. My mother, Mrs. Scott-Edwards, is an AP English teacher at the John D. O’Bryant School of Mathematics and Science in Roxbury, Massachusetts and she allowed me the opportunity to collect data from her class of high school seniors. The John D. O’Bryant is considered a Title 1 school and receives financial assistance to provide reduced-priced or free lunch as the school serves a high number of students from low-income families (Federal Grant Programs, 2019).

The survey focused on what students were currently learning about food and nutrition and if they were using lessons learned from school when making decisions about what to eat.

From the responses, the students had received some information on the importance of eating according to the nutrition plate, the food pyramid, and the understanding that it is essential to have balanced meals each day. However, some of the responses noted that they had not learned much and when asked if nutrition was something they were prioritizing, a few said yes, but a majority answered no or not really. One student even responded, “Not as much as I should be. I don’t have the fastest metabolism, but it’s not slow either, so I don’t focus on eating healthy because I wouldn’t gain a lot of weight if I ate unhealthy foods”. The John D. O’Bryant serves a number of students who fall within the low-income bracket and may be utilizing the programs and services offered from the city of Boston’s Office of Food Access. Still that response reiterated why improvement to food and nutrition education is needed in addition to increasing access to healthy food. Without the understanding of the importance of maintaining a healthy diet, those programs will continue to be underused, and the number of sick individuals will continue to rise.

How Can I Help?

In Mayor Marty Walsh of Boston’s *Food Access Agenda to End Food Insecurity*, he describes goals to complete this task by 2030. 2 out of 5 of those goals involve developing shared resources and strategic opportunities and building public awareness of food insecurity and the available resources, programs, and services (Pineda, 2019). To do my part to aid in the completion of these goals, I want to develop a new food and nutrition program, *Nutrition with Nadjia*. It is crucial to provide food insecure individuals with as much relevant information as possible to increase understanding of how consuming unfavorable quantities of unhealthy foods can have long term adverse effects on the body while promoting actionable steps they can take to implement a healthier diet.

Food and Nutrition Information Session Outline

The program will provide information sessions to educate participants on the importance of maintaining a healthy diet and ways they can implement changes in their everyday lives, from how to review nutrition labels to understanding what foods and ingredients to avoid and which to eat more of and why. I want participants to leave the session with an increased awareness of what they are putting in their bodies and an understanding of how to make educated decisions about their food choices. The session will begin and end with a survey. The survey will include questions to determine if the information provided was retained and feedback questions to gain input into what they enjoyed and what could be updated for a future iteration. My goal is for these information sessions to be available for the general public in schools, churches, community centers, local gyms, etc. Getting to the information session should not be a barrier for attendance, so they need to occur places that are visited frequently.

Brief discussion on Food Insecurity

The food and nutrition information sessions will be open for anyone to attend, but it is important to discuss food insecurity during the sessions. Opening the conversation to discuss hardships attendees may be facing or getting non-food insecure individuals to learn more about this topic is a goal for this program. It is necessary to raise awareness so that those who may be experiencing food insecurity understand that there is help out there and so those who are not can assist in reducing this issue.

Importance of Maintaining a Healthy Diet

The core of these information sessions will discuss the importance of maintaining a healthy diet to prevent potential health problems. 60 - 80% of the immune system is within the gastrointestinal system, the gut. Meaning the majority of white blood cells that protect the body are housed within the stomach. The immune system will become activated and trigger inflammation when something foreign enters the body, ranging from “an invading microbe, plant

pollen, or chemical” (Harvard Women’s Health Watch, 2018). The body will go through inflammation to protect itself from invaders, which occurs when we get sick, for example. Another foreign invader that can cause inflammation are certain foods. The constant consumption of foods considered to be invaders means that the body is working overtime to fight off the foreign entities. When this occurs, the amount of bacteria in the stomach and intestines can be unbalanced, causing gut dysbiosis.

The most common type of gut dysbiosis is excess bacteria or yeast in the small intestine, which can be seen most obviously through skin rashes, joint pain, and general inflammation (Ballantyne, 2013, pg. 63). Gut dysbiosis can lead to leaky gut, meaning the tight junctions of the intestinal wall start to disconnect, allowing molecules to “pass back and forth amid the gut wall”, activating the immune system to defend against foreign invaders (Gundry, 2020) (Andrews, 2020). Crohn’s disease, ulcerative colitis, and other types of irritable bowel syndrome are common diseases seen with this but cancer, heart disease, diabetes, arthritis, depression and Alzheimer’s have also been linked to extended periods of leaky gut (Ballantyne, 2013, pg. 90) (Andrews, 2020). While we may not be able to control all the triggers of inflammation in our bodies, one we can control is our consumption of foods that are known to cause damage to the gut and contribute to gut dysbiosis.

Preventing Gut Dysbiosis

Food can be a major contributor to gut dysbiosis. These can range from foods that are known for being inflammatory to foods that are commonly considered healthy, but due to their natural chemicals, cause trouble when digested. These harmful substances include lectins, digestive-enzyme inhibitors, saponins, and phytic acid. A full list of foods to avoid as they can cause gut dysbiosis is included in Appendix A.

Lectins are carbohydrate-binding proteins that exist in all food, but toxic lectins are difficult to digest and interact and damage the intestinal lining. When this happens, the lining may not be as secure and can cause leaky gut, making it difficult for the body to absorb essentials, such as vitamins and minerals (Andrews, 2020).

Food groups that have toxic lectins are grains, pseudo-grains, legumes, and nightshades. These are foods that are often a staple in some diets but can lead to disease after years of constant consumption. The effects of these foods can be more drastic, depending on the person. Celiac disease, the inability to eat gluten, is an example of how harmful these foods can be on some, where others can eat items containing gluten and not feel any effects. Even though some may have more extreme reactions than others to foods containing lectins, all should work to remove or decrease the consumption of these foods to help protect the gut.

Digestive-enzyme inhibitors are anti-nutrients, meaning they interfere with the absorption of nutrients in food. They are found in grains, pseudo-grains, and legumes. These are dangerous because they survive when cooked and do not digest, causing increased levels of gut dysbiosis. Seeds also contain digestive-enzyme inhibitors because their primary purpose is to grow into a new plant, causing them to be indigestible. When someone eats a seed, the body's digestive enzymes are inhibited and prevent the "enzymes that break apart proteins and starches or sugars from doing their jobs" (Ballantyne, 2013, pg. 104). When the seeds are large enough to ground or chew, the digestive-enzyme inhibitors get released into the gut. Another chemical that can limit the activity of digestive enzymes when consumed in excess is phytic acid. Along with digestive-enzyme inhibitors, phytic acid can increase gut permeability. Phytic acid is found in all seeds, including tree nuts, edible flowers, and vegetable seeds.

Saponins are another chemical that can increase intestinal permeability and are in all plants, specifically in their seeds. They are “designed to protect the plants from consumption by microbes and insects by dissolving the cell membranes of these potential predators” (Ballantyne, 2013, pg. 108). Saponins are found in legumes, pseudo-grains, and vegetables from the nightshade family. Overconsumption of foods containing saponins can be poisonous because they interact with cholesterol molecules and can form gaps in the body’s cell membranes, allowing different substances in the gut to enter the cell.

- Grains include: barley, corn, millet, oats, rice, rye, sorghum, wheat, wild rice.
- Pseudo-grains include: buckwheat, chia, quinoa.
- Legumes include: chickpea, common bean, fava bean, field pea, lentil, lima bean, peanut, soybean.
- Nightshades include: bell peppers, bush tomatoes, eggplant, goji berries, hot peppers, paprika, pepinos, potatoes (not sweet potatoes), tomatoes

As these foods can be staples in some diets, it may be difficult to remove them completely. While research is still being conducted to determine if digestive-enzyme inhibitors, saponins, and phytic acids can be removed, there have been proven ways to reduce or even remove lectins from certain foods. These foods should still be eaten in moderation even when lectins are removed, because they contain the three other chemicals that can cause gut dysbiosis. Ways to reduce the amount of lectins in foods include; soaking, pressure cooking, peeling and deseeding, fermenting, and refining.

Soaking beans, legumes, and sometimes grains overnight can help reduce the lectin content in the items. The water must be changed often and drained and rinsed before cooking.

Pressure cooking can help remove lectins in beans, legumes, and certain vegetables.

The part of vegetables that contain the most substantial amount of lectins are the hull, peel or rind. Peel the vegetables by using a peeler or boiling them and deseed by using a spoon to scoop out the seeds before eating.

The fermenting of fruits and vegetables allows good bacteria to break down a good portion of the plants defensive and damaging substances.

For grains, it is best to eliminate them from the diet, but if this is impossible, it is best to choose refined, “white” grains over whole grains. The hull found in whole grains and brown rice contains a large amount of lectins. (Gundry MD Team, 2019).

Avoiding Inflammatory Ingredients

In addition to the foods that can lead to overgrowth of bacteria and yeast in the small intestine, ingredients that fall into the inflammatory foods category should be avoided. When grocery shopping or getting food on the go, make sure to read the ingredients and avoid ones that fall into the highly inflammatory category.

Sugar

Sugar is one of the most inflammatory ingredients and has horrible side effects. White refined, processed sugars suppress white blood cell function by feeding the bad gut bacteria in the stomach. White blood cells are the main line of defense against viral and bacterial infections, so it is vital to make sure these are plentiful.

There are a few less inflammatory sugars that can be used instead, such as monk fruit sweetener and pure stevia extract with no natural flavors. But still be careful of sugar alternatives that are man-made as they can be toxic to the body. For example, Splenda, made from aspartame and sucralose, is a man-made sweeteners that the body and brain can’t recognize.

In general, the amount of sugar consumed should still be limited because any sugar can disrupt the bacteria in the stomach. But sugar can be hard to eliminate, so try to go for the healthier options that contain less inflammatory sugars (Parrish, 2020).

Oils

Highly inflammatory oils alter the fatty acid composition, causing them to be unrecognizable by the brain. When this occurs, the brain does not know how to store it, so it becomes fat. Canola, safflower, soybean, sunflower, and corn oil are highly processed at high temps and high pressures.

Low inflammatory oils should be used instead, as they are not highly processed or refined and are heart-healthy. These include avocado oil, coconut oil, and olive oil.

Fats

Brains are mostly made of fat; the myelin sheaths that protect nerves need healthy fats to keep them insulated. When there is constant consumption of fats that have been combined with sugar and simple starches, the nerves start to store that unhealthy fat instead of the healthy fat it needs, causing inflammation leading to weight gain and disease.

The saturated fats to avoid include margarine, shortening, and palm oil. It is difficult to avoid palm oil, because it is cheap to use, but it is highly processed and refined.

Healthy saturated fats include grass-fed ghee, fat from 100% grass pasture-raised beef, avocados, and coconuts. These types of fats are necessary because they “naturally promote healthier levels of fat-soluble vitamins (A, D, E, and K) that help regulate the immune system” (Ballantyne, 2013, pg. 74).

Deciphering Ingredients

When reviewing the ingredient list of certain foods, check how many are listed because foods with a lot are usually highly processed. “The more food is processed, the more nutrients are stripped out of that food. Also, the processing of foods removes valuable nutrients from those

foods and often adds or creates anti-nutrients, which are substances that hinder the bodies absorption of nutrients from food” (Ballantyne, 2013, pg. 72). While these have less nutritious value, they taste great, leading to the want to eat more. When it comes to ingredients a good rule to follow is if it can’t be pronounced, avoid it. A listing of common names found in ingredients lists and what they are can be found in Appendix B. These ingredients should be avoided as they are inflammatory foods.

Foods to Eat More

While it may seem that there are a lot of foods and ingredients that should be reduced from one’s diet, there are so many foods that can be included without the need to worry of it will be inflammatory or negatively affect the gut. Not all of these foods have to be included in diets if they go against beliefs and should still be consumed in moderation, but they are all suggestions of foods that are anti-inflammatory (Appendix C).

Understanding nutrition labels

Nutrition labels began in the mid-1960s and only required ingredients to be listed, but now they have been updated to include the amount of protein, carbohydrates, fat, vitamins, minerals, etc. These additions are to help people make healthier decisions. When it comes to nutrition labels, there are a few things to review to ensure the correct items are being purchased; ingredients, serving size, calories, trans fats, added sugar, sodium, and nutrients with added benefits.

Serving Size

There have been times when one handful of chips turns into the third or fourth and suddenly, half the bag is gone! While it was tasty in the moment, more calories were eaten than planned. This is where the recommended serving size comes in. The serving size is listed on nutrition labels to note the amount of food represented in the nutritional breakdown, meaning the

amount of calories is for a single serving. Be aware of this amount as we often will eat more than this suggested serving, especially when it comes to processed foods like chips.

Calories

There has been a stigma around “bad” calories vs. “good” calories depending on the food being eaten to get those calories. The amount of calories in each food item tells what “proportion of your overall daily fuel intake the food represents, especially for processed foods” (Thomas, 2020). Do not go over the recommended daily calorie intake, but calories are not what affects the body; it is what contains those calories that matters.

Understanding Food Labels and Terms

“Cage Free” - is often seen on chicken products. This means that the chickens were raised without being in cages. However, these chickens could still have been living indoors in overcrowded spaces.

“Pasture Raised” - is used when the animal was able to spend time outdoors and was fed a grass diet.

“Grass Fed” - means that the food source for the animals came from grass or forage and not grains.

“No Antibiotics” - can be listed on a package if the animal was not fed antibiotics over the course of its life. However, it does not provide feedback on their living conditions.

“Calorie free” - means that there are less than 5 calories per serving.

“Excellent source of...” – depending on what comes after this phrase means that it provides at least 20% of the daily value of the certain vitamin or nutrient per serving.

“Fat-free/sugar-free” – means there is less than ½ gram of fat or sugar per serving.

“Good source of” - depending on what comes after this phrase means that it provides at least 10 – 19% of the Daily Value of the particular vitamin or nutrient per serving.

“High In” - depending on what comes after this phrase means that it provides 20% or more of the Daily Value of the specified nutrient per serving.

“Low Calorie” – is used when there are 40 calories or less per serving.

“Low Cholesterol” – has 20 milligrams or 2 grams or less of saturated fat per serving.

“Low Sodium” – has 140 milligrams or less of sodium per serving. (Thomas, 2020)

Piloting Nutrition with Nadjia

It was vital to conduct an initial food and nutrition information session to test if the discussion points drafted would connect with an audience that may not have ever explored the topic or would not consider the issue as existing within their immediate realm of concern.

Thanks to my mother, I was able to talk with a few of the seniors at the John D. O’Bryant, who I was able to survey previously. For future iterations, I hope to be able to bring in a broader audience, but I did feel these high school students were a good initial audience as they are at highest risk of taking unhealthy habits with them into their adult life. The transition from high school to college or post-grad can be challenging and is a critical time because these students can “increase their unhealthy eating habits when away from home, lower their consumption of healthy options, have irregular meals, or an increased intake of unhealthy snacks” (Sogari et al., 2018). The initial plan was for me to present during one of their class periods and bring in healthy snacks and desserts to get them excited about the information however, due to COVID-19, plans were moved online.

A mass email was sent out to all 118 of my mother’s students to gauge their understanding of food and nutrition concepts and food insecurity. It also asked what and if students were able to access enough food during COVID-19 as many of these students rely on school breakfast and lunch for a portion of their meals. Due to this pandemic, the City of Boston

and the Boston Public Schools have been extremely concerned about students' access to food. From the 118 students, I received 49 responses (Appendix D).

About half of the students had an understanding of food insecurity, but the other half had not heard the term or were unsure of its meaning. In seeing that response, I knew it needed to address this during the session, not in-depth but enough so that they understood that this could be a barrier in being able to maintain a healthy diet. I then asked if students had been able to eat three meals a day now that they aren't physically going to school, and to my relief, 33 responses out of the 48 were yes. Students were saying they had more time now to make meals because they weren't running from school, to work, to homework. For those remaining no responses, I wanted to make sure I pointed them in the right direction of where they could access food in the presentation. While I was relieved that the majority of students had access to food, the type of meals they were eating brought me back to the importance of running this information session. Many responses included snacks, take out, pasta, dessert, and fries, with the occasional mix in of proteins, veggies and fruits. To protect these students' immune systems now and for the future, I found the concepts drafted relevant.

The *Nutrition with Nadjia* information session was first planned to take place over zoom on Friday, April 18th, but was rescheduled to take place during the student's April vacation. I was nervous that students would not show because of that, but the students were offered extra credit as an incentive to join the session. With that help, 20 students signed up to join the call. I am not sure how many would have called in without that bonus, but I hope to continue these sessions in person and entice participation through food and fun! The zoom meeting was scheduled for an hour, so I had to trim down some of what I wanted to present. The session focused on food access during COVID-19, defining food insecurity, programs providing food assistance in

Boston, diseases that have been linked to an unhealthy diet, a little about me and my journey with food and health, the importance of maintaining a healthy diet, foods that can harm the gut, foods that can help the gut, how to help boost the immune system during COVID-19, and the understanding that it is okay to eat snacks and have those less healthy items as long as the foundation is strong through the maintenance of a healthy diet.

With the change from in-person to zoom, I was nervous that the level of participation would be affected. I wanted to ensure this session was informative as well as entertaining. These students sit and get lectured to enough, so I tried to make sure this was different than what they had been receiving in school. To my surprise, the zoom meeting went much better than expected. I used writing prompts throughout the session using a web app called *Padlet* to get the students comfortable with thinking and writing down ideas. In this app, you can add a prompt to the page and have students comment on it anonymously. I used this as I wasn't sure if they would want to discuss out loud their answers to, "During COVID-19, have your nutritional choices been affected by lack of access to food?". The responses varied from lacking the motivation to eat healthy, so there has been a lot of snacking, to eating a lot less fast food because there is more time to cook, or nutritional intake has been limited due to shortage in food (Appendix E). This question opened the session and was a good lead into discussing food insecurity, how Boston is addressing this with food programs, and where students can access free meals now.

The biggest challenge with zoom was presenting and not being able to see all of the students' facial expressions. It was hard to tell if I was reaching them or if they were paying attention. As the session continued, the students seemed to become more involved by making verbal comments or writing comments in the chat bar. That was a bit of an unexpected time

consumer because I would stop to read and address the student comments as they came in, but I was glad they were engaging in ways they felt comfortable.

While the information regarding which foods should and shouldn't be eaten was the most important, in my opinion, it seemed like the students connected most with my personal story. I decided to share a few images of me as I transitioned from senior year of high school to 4 years post-college graduation.



Figure 3. Senior Year of High School



Figure 4. Sophomore Year of College



Figure 5. Senior Year of College



Figure 6. 2 Years Post Graduation



Figure 7. Current Me

These images seemed crucial to include in the presentation after reading, “Not as much as I should be. I don’t have the fastest metabolism, but it’s not slow either, so I don’t focus on eating healthy because I wouldn’t gain a lot of weight if I ate unhealthy foods” in response to my previous food and nutrition survey question, is nutrition something you prioritize? Image is a big

concern for many people, which is why there is a large focus on working out and weight loss, but only 20% of weight loss is contributed to exercise. The other 80% is nutrition (Edwards, 2019). The students were able to see a potential outcome of large consumptions of unhealthy food, college stress, and real-world transitions.

As these sessions continue, it would be great to include additional testimonials so students can see different outcomes, as one story is not like another. After I shared my story, I wanted the students to start thinking about life after high school, so I had a second writing prompt for them to complete on *Padlet*. “If you did not have your parents to cook for you, what do you think you would eat?”. A few of the students wrote that they currently cook for themselves and family members, so they feel confident in continuing to do that on their own, but a majority resorted to fast food, uber eats, ramen noodles, and pasta (Appendix E). If it were possible to meet with this group again, I would bring easy meal recipes for them to try.

The pilot *Nutrition with Nadjia* information session ended 30 minutes over, and the students were engaged and interested throughout. From my perspective, it went well but needed the post-session survey feedback to confirm. At the end, an email was sent to the 20 students who attended with the presentation slides and notes and a link to complete the post-survey. The seven responses received from the post-session survey have been encouraging (Appendix F). Students enjoyed learning different ways to eat healthier, how I implemented my personal life into the session and used lessons learned to change my diet, how interactive and personal it was, and how big concepts were broken down and understandable. I also asked a few multiple choice questions on what types of food they should buy and what they should avoid. In the responses, it seemed like the majority understood, but more time could have been spent going over the food items in greater detail. This information was towards the end of the presentation and by that time

the session had been going for close to an hour, so I felt the need to rush through and not read every food item. Perhaps the students weren't following all of the slides, so that caused this disconnect.

Lastly, I asked for suggestions for improvement and what they still want to learn about food and nutrition. The students wanted to learn healthy recipes, learn more about lectins, understand how stress can play a role in health, how to find correct information about nutrition on the internet as views can be different depending on the source, and how to read nutrition labels correctly. From the responses it is clear that there is a need for a recurring information session such as this, one student even wrote, "give yourself more time because it's a huge topic with questions, etc. You should try and schedule one and a half to two hours". This response made me excited about the future potential of a program such as this.

The overall experience of running this pilot *Nutrition with Nadjia* information session was positive. The students found it enjoyable, and benefit from participatory activities and story sharing. If given more time, I would have students share their experiences with food and health if they felt comfortable. Additional activities would have been helpful, as well. These could range from reviewing different nutrition labels and having the students determine which item should be purchased, to picking out unhealthy ingredients in common food items, to finding recipes for foods they would want to try on their own. The students showed great interest in this topic and had questions throughout that couldn't be adequately addressed due to time. It was clear that they would greatly benefit from a designated space to explore food and nutrition.

What is next for Nutrition with Nadjia?

Considerable progress has been made in improving access to food for those in food insecure situations in Massachusetts and Boston. Having the feasibility to purchase healthier

foods will aid in the improvement of health and minimize potential diseases that can occur due to an unhealthy diet. While someone may have increased access to healthier options, this does not mean they will automatically change their ways and start purchasing these items without a deeper understanding as to why they should. A push for food and nutrition education seems like the necessary next step to help reduce potential diseases that can occur in this and future generations.

To ensure the reduction of potential disease, I want to continue working with the John D. O'Bryant in a more official capacity to hold quarterly food and nutrition information sessions for the students. This entry could potentially lead to information sessions at other schools in the Boston area and schools around Massachusetts. My overall goal is to bring this information to the general public but will need the support of additional resources and constituents that could be built along the way. For now, I hope that the students will bring this information to their parents and family members, and change can start from within.

In addition to the in-person food and nutrition program, I want to develop a blog as they allow people the opportunity to “connect and network with likeminded individuals who share the same passions” (Dekmezian, 2015). I hope that this blog is viewed by anyone interested in increasing their understanding of the connection between food and health. Blogs can help “build awareness and garner support while offering the opportunity to educate others by building resources” (Dekmezian, 2015). This blog can be updated with posts on the importance of health, different diets focused on improving the immune system, my story and why I am interested in this topic, information about the food and nutrition information sessions, and recaps from sessions. With this online documentation, my information sessions could reach those with the power to make significant changes and bring an even greater legitimacy to my ideas.

Concluding Thoughts

From the pilot of *Nutrition with Nadjia*, it was clear that the topic of food and nutrition sparks engagement and interest, but is currently not prioritized in those who need this information the most. Now more than ever, we realize how important food is in the protection against health risks. Improvements have been made to increase accessibility and affordability of healthy food items for those experiencing food insecurity. Still, without a greater emphasis on education, these programs will be for not. Protection against disease starts from within, and the more this is discussed, the more everyone, including those who would typically be at greatest risk, will be able to handle future health concerns.

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Appendix A: Foods that lead to Gut Dysbiosis

Added Sugars	Processed Food Chemicals and Ingredients	Processed Vegetable Oils	
<ul style="list-style-type: none">• Corn Syrup• Dextrose• Fructose• Fructose Syrup• High Fructose Corn Syrup	<ul style="list-style-type: none">• Artificial Dyes and Brighteners• Artificial and natural flavors• Thickeners and Emulsifiers• Artificial Sweeteners• Any ingredient with a chemical name you don't recognize	<ul style="list-style-type: none">• Canola oil• Corn oil• Palm oil• Safflower oil• Sunflower oil• Soybean oil	
Grains and Gluten	Pseudo-Grains	Legumes	Nightshades
<ul style="list-style-type: none">• Barley• Corn• Durum• Millet• Oats• Rice• Rye• Sorghum• Wheat• Wild rice	<ul style="list-style-type: none">• Amaranth• Buckwheat• Chia• Quinoa	<ul style="list-style-type: none">• Black beans• Black-eyed peas• Chickpeas• Fava beans• Green beans• Kidney beans• Lentils• Pinto beans• Peanuts• Soybeans	<ul style="list-style-type: none">• Bell peppers• Bush tomatoes• Eggplant• Goji berries• Hot peppers• Paprika• Pepinos• Potatoes (not sweet potatoes)• Tomatoes

Appendix B: Common Ingredient Names and what they Really Are

Artificial Dyes and Brighteners <ul style="list-style-type: none"> •Blue 1 •Caramel Color •Red 3 (Erythrosine) •Red 40 •Titanium Dioxide •Yellow 5 (Tartrazine) •Yellow 6 	Artificial Flavors and Enhancers <ul style="list-style-type: none"> •Autolyzed yeast extract •Hydrolyzed protein •Monosodium glutamate (MSG) •"Natural Flavors" 	Artificial Sweeteners <ul style="list-style-type: none"> •Acesulfame potassium •Aspartame •Neotame •Sucralose/Splenda 	Sugars <ul style="list-style-type: none"> •Corn Syrup •Dextrose •Fructose •Fructose Syrup •High Fructose Corn Syrup 	Bleached Flours <ul style="list-style-type: none"> •Other processed flours
Refined and Processed Oils <ul style="list-style-type: none"> •Canola •Corn •Cottonseed •Partially Hydrogenated Oils •Soybean 	Preservatives <ul style="list-style-type: none"> •BHA (butylated hydroxyanisole) •BHT (butylated hydroxytoluene) •Calcium propionate •Propylparaben •Methylparaben •Sodium benzoate •Sodium nitrate 	Thickeners and Emulsifiers <ul style="list-style-type: none"> •Carrageenan •Lecithin •Gellan gum •Cellulose gum •Guar gum •monoglycerides •diglycerides 	Dough Conditioners <ul style="list-style-type: none"> •Azodicarbonamide •calcium peroxide •DATEM (diacetyl tartaric acid esters of monoglycerides) 	Processed Food Supplements <ul style="list-style-type: none"> •Soy protein isolate is seen in diet foods and should be avoided as it is a highly processed genetically modified protein supplement

Appendix C: Foods that Promote a Healthy Gut

Red Meat <ul style="list-style-type: none">• Beef• Bison• Goat• Lamb• Pork• Rabbit	Fish <ul style="list-style-type: none">• Salmon• Anchovy• Catfish• Cod• Haddock• Pollock• Sardine• Tilapia	Poultry <ul style="list-style-type: none">• Chicken• Duck• Turkey	Shellfish <ul style="list-style-type: none">• Clams• Crab• Crawfish• Mussels• Oysters• Scallops• Shrimp
Leafy Greens and Salad Vegetables <ul style="list-style-type: none">• Artichoke• Arugula• Asparagus• Bok choy• Broccoli• Brussel sprouts• Cabbage• Carrots• Cauliflower• Celery• Collard greens• Kale• Lettuce• Spinach	Alliums <ul style="list-style-type: none">• Chives• Garlic• Leek• Onion• Shallot	Fruits <ul style="list-style-type: none">• Açaí• Blackberry• Blueberry• Cranberry• Grapes• Raspberry• Strawberry• Apple• Cherry• Peach• Pear• Plum• Cantaloupe• Honeydew• Watermelon• Clementine• Lemon• Lime• Orange• Banana• Mango• Papaya• Pineapple	Healthy Fats <ul style="list-style-type: none">• Avocado• Avocado oil• Bacon fat• Coconut oil• Lard• Olive oil (extra-virgin or virgin)• Poultry fat

Appendix D: Nutrition with Nadjia Pre Survey Responses

Survey can be found via:

https://docs.google.com/forms/d/e/1FAIpQLSecgkxfzzkqo263jupZ6e9oJXrZ_2PpMIvSIJ3xzcyDbIBLA/viewform?usp=sf_link

What does the term Food Insecurity mean?	Now that you are not physically going to school, have you been able to eat three meals a day?	What foods have you been eating during this quarantine?	Have you heard the phrases inflammatory or anti-inflammatory foods?
Disturbance of food intake because of lack of money or other resources.	No	Snacks, food from outside	No
Not having access to adequate food supplies all of the time.	Yes, and I have access to more than enough food at home.	I have been eating a lot of fruits and vegetables, as well as bread products, pasta, and various snacks.	Yes
not knowing when or where the next meal may come	yes	a lot of rice bowls	Maybe
I'm not entirely sure, but I would assume not having the access to nutritious food.	Yes, I have.	Usually home cooked meals, and munch on snacks like chips, trail mix, and granola.	Yes
Not having a sustainable amount of food or not knowing if you have food to eat.	Yes	Anything my parents or I cook.	Yes
Someone who is unable to get a guaranteed 3 healthy meals a day/caloric intake	Somewhat. Not because of a lack of food but a laziness to cook and an inability to choose	Pasta's, meats (beef, chicken, pork), rice, etc.	Yes
It means not having access to affordable nutritious food	Yes	Home made meal, oatmeal, eggs, cereal and snacks	No
Not having access to enough affordable and nutritious food.	Yes	Pasta, salads, fries, fruits, meat, snacks, etc.	Maybe
I do not know.	yes	All types of meals from my country.	Maybe
Not having enough food to eat.	Yes	Vietnamese food	No
Food insecurity is when people do not have access to food.	Yes. But sadly, during quarantine, I am over eating.	Rice, cereal, chips, chicken, soup, pork, ramen noodles, plantains, beef, eggs, sandwiches, cookies, saltine crackers, coffee, fries, potatoes, etc.	No
foods that are unhealthy	yes	ramen, rice, chicken, soup	Yes
No access to affordable nutritious food.	Yes	Rice, vegetables, meat, fruits, milk, eggs, juice, different types of grains.	Yes

maybe being scared to eat certain foods	Not so much. It's been a little inconsistent.	Bagels for breakfast, pasta for lunch, rice for dinner	Maybe
the state of being without reliable access to a sufficient quantity of affordable, nutritious food.	through the supply of food that my mom buys	good cooked meal but also a lot of snacking so junk foods	Yes
The state of being without reliable access to good food.	yes	Proteins, meat, etc.	Yes
Never heard of it to be honest.	I don't eat three meals a day usually two and snacks in between.	Rice, Bean, turkey, pig, eggs, chicken etc	No
not enough food	yes, but I don't because it just sleep for 15 hours of the day wake up and eat one meal to sleep again.	fish soup, pho, rice, ramen, pasta, eggs, nutella	Yes
Being insecure or unsure about eating certain types of food	yes, it is easier to keep up with my meals now that I have the extra time to prep.	burgers, rice and kimchi, fried eggs, sausage, chicken breast	Yes
It means a lack of nutritious foods.	Yes I have been.	My mom usually makes stuff like rice, spaghetti, steak, tacos	Maybe
Not being comfortable with the food you have to eat.	Yes	Whatever my mom cooks me	Maybe
I dont know	yes	fruit, chicken, ice cream	Yes
I think the term means your not comfortable with your relationship with food and that may come in different forms.	No	I've been eating a lot of junk food if we're being honest.	Yes
A difference in food intake based on lack of money or resources.	Yes	Pancakes, rice, lots of rice, African food mainly	Maybe
not enough food	yes	eggs	Maybe
Not having access to healthy/nutritious foods.	Yes	Everything!	Maybe
food insecurity the lack of reliable access to a sufficient quantity of affordable, nutritious food.	Yes.	Meat, fruit, vegetable, snacks, anything.	Maybe
Food Insecurity is a term used to describe when an individual doesn't have a reliable supply of nutritious food.	Yes I have.	Mostly homecooked food such as rice, baked chicken, mashed potatoes, and some vegetables.	Yes
Not being able to eat or something.	Somewhat	Nutritious stuff	No
When people do not have access to healthy food or food at all because of their location	Yes	Rice, chicken, fruits, snacks	Maybe

Not being sure that your body is able to get the nutrients it needs	Yes	Rice, vegetables with meat or fish and sometimes spaghetti or ravioli	Yes
not sure	yes	home made meals like rice beans chicken	Yes
I think this means that people are insecure in the food they eat, meaning they have to secondhand guess whether they should eat this or not because of how it will make them appear.	No. Even before school I wouldn't eat three meals a day. It is usually either one or two meals a day.	I have been eating a lot of different variety of food. But mainly just protein and carbs. This quarantine I've been eating more fish which is very good.	No
A food shortage	Yes	Cereal, Fish, Chicken, home cooked meals	Maybe
I think it means to not have food readily available/ accessible to you.	No, I usually just eat twice a day and then eat snacks here and there.	Whatever my mom cooks- rice, meat, vegetables, and a few cookies/chips.	Yes
I don't know, maybe when you dont know where your food will come from.	wellll....at first I wasnt able to. But now I am.	Rice and beans. Some meats. Juice. A LOT of water.	Yes
Not having enough access to affordable and nutritious food.	Yes it's been easier to have three meals a day.	Rice, vegetables, fruits, fish, chicken, and beans	No
being unable to have a reliable source of food	yes	rice, potatoes, meats, dairy	Yes
I don't know	no	Frozen food, pantry food, less vegetables and meat than I did before	No
Being in a position in which food is scarce.	No. I did not even eat three meals a day on school days.	Pasta, Rice, Cereal, and Ice Cream.	Maybe
I think it means having some sort of bad relationship with food.	I eat way more than 3 meals a day	rice beans chicken pasta oranges eat	Yes
Lack of resources or availability to get food.	nope.	packaged food and vegetables.	No
I don't know what that means.	No.	Junk food, rice, some fruits or whatever I can find at home.	Maybe
Not knowing if you will be able to have food tomorrow or at any time	Yes	Home cooked meals	Yes
low access to food	yes	the canned sphagethi	No
It means that you don't always have enough food to make a meal.	Yes	A large variety, but a large amount has been perishable food.	Maybe
Insecurity, in this context, would mean that there is a lack of resources a person or people have access to and because insecurity is a feeling; this means that these people also have fear	A bit. I skip breakfast	I have been eating pasta, cole slaw, rice and stew,	No

due to the lack of access. So, food insecurity is when there is a lack of access to food, nutrition, and etc			
One's ability to get food	yes	rice, meat, fruits	Yes
Not having reliable access to healthy foods in your home	I can if I would like to, but I usually skip breakfast since I wake up later	I have been eating many different kinds; Cereals, fruits like grapes, watermelon, oranges, pineapples, sometimes meat like chicken or beef, and I have been consuming different types of liquids like water and juice with a dash of soda.	Maybe
According to Google food Insecurity is the state of being without reliable access to a sufficient quantity of affordable nutritious food.	I can eat 3 meals of food, but I have not eaten 3 meals a day.	A lot of Raisin bagels with cream cheese and food my mother makes sometimes.	No
The state of being without a reliable source of affordable and nutritious food.	No, I don't particularly eat three meals a day.	Rice, meat, chicken, salad, fruits, and etc.	Yes

Responses continued...

Which oils should you have? check all that apply	Why is it important to avoid added sugar?	Which item should you purchase based off the nutrition label?	Have you heard of The Boston Summer Eats Program? If yes, how did you hear about it?
coconut oil, olive oil	It's not natural sugars found in the food.	Nutrition Label 2	No
coconut oil, sunflower oil, olive oil	It is unhealthy when consumed excessively, as it can cause obesity, problems with people's blood sugar, increased risk of heart disease, and other health problems.	Nutrition Label 1	I forget if I have heard about it, but if I have, it may have been from an email from the O'Bryant.
olive oil	To avoid excess insulin	Nutrition Label 2	no
coconut oil, sunflower oil, olive oil	Added sugar is bad for your health, it can cause heart and blood issues in the future.	Nutrition Label 2	No
olive oil	It can causes many health issues like obesity due to the caloric density of sugar. Another reason you should avoid sugar is because it can lead to diabetes which is a life threatening condition.	Nutrition Label 2	No
olive oil, corn oil	Too much of it can lead to tooth decay, diabetes, kidney and liver issues, etc.	Nutrition Label 1	

	It is important as added sugar can lead to weight gain and many medical issues.	Nutrition Label 2	No
coconut oil, olive oil	It can lead to weight gain, blood sugar issues, and cause heart problems.	Nutrition Label 2	No
olive oil, corn oil	Because it is unhealthy	Nutrition Label 1	no I have not.
olive oil	It is bad for your health.	Nutrition Label 2	No
coconut oil, olive oil	It is important to avoid added sugar because the sugar isn't dissolved as well in the body, and continues to stay in your body and blood stream.	Nutrition Label 2	No
olive oil	diabetes, ageing	Nutrition Label 2	no
olive oil	Could increase blood sugar level	Nutrition Label 1	No
coconut oil, sunflower oil, corn oil	To avoid diseases like diabetes	Nutrition Label 1	no
coconut oil, olive oil, corn oil	An excess of sweetened foods and beverages can lead to weight gain, blood sugar problems and an increased risk of heart disease, among other dangerous conditions	Nutrition Label 2	yes through school admin
coconut oil, olive oil	It leads to weight gain and increased risk of heart disease	Nutrition Label 2	No
coconut oil, olive oil, corn oil	It can increase the chance of having diabetes and other health issues.	Nutrition Label 2	No
	because its bad for your skin and is proven to worsen dandruff, be as addicting as cocaine and can contribute to mood swings	Nutrition Label 2	no
coconut oil, olive oil, corn oil	to avoid diabetes	Nutrition Label 2	no
olive oil	It can cause weight gain and other health problems such as diabetes, high blood pressure and heart disease.	Nutrition Label 2	No I have not
olive oil, corn oil	It makes the food less real and too much sugar is not good for you	Nutrition Label 2	Nope
coconut oil, olive oil	it is unhealthy	Nutrition Label 2	no
coconut oil, olive oil	Added sugar doesn't help the body it just gets stored away as a fat source.	Nutrition Label 1	No I haven't
coconut oil, olive oil	It can mess with you blood levels, plays a similar roll as in salt	Nutrition Label 2	No.
olive oil	too fattening	Nutrition Label 1	no
coconut oil, sunflower oil, olive oil, corn oil	Because it is not healthy.	Nutrition Label 2	No, I have not
coconut oil, sunflower oil, olive oil	It isn't healthy.	Nutrition Label 1	No

coconut oil, sunflower oil, olive oil, corn oil	Most foods are already sweet so added sugar are unnecessary calories being added.	Nutrition Label 2	No I have not.
coconut oil	It's badddd	Nutrition Label 2	No
olive oil	It can spike your blood sugar and make you hyper	Nutrition Label 1	No
coconut oil, olive oil, corn oil	These are usually more complex sugars that our bodies struggle to break down and we already consume more the enough sugar then we need	Nutrition Label 2	No
coconut oil, sunflower oil, olive oil	its unnecessary sugars	Nutrition Label 2	no
corn oil	I think it is important to add sugar because the sugar gives you energy.	Nutrition Label 1	No.
coconut oil	They have GMOs in them?	Nutrition Label 1	No
coconut oil, sunflower oil, olive oil	So you don't end up getting diabetes.	Nutrition Label 2	No.
coconut oil, sunflower oil, olive oil, corn oil	sugar is just bad for you. It has a lot of calories in it and could raise your blood pressure.	Nutrition Label 2	no
coconut oil, olive oil, corn oil	Added sugar is beneficial to your health. Yes it helps sweeten food but it has no actually nutrition. If anything they can cause high blood sugar.	Nutrition Label 2	no
coconut oil, sunflower oil, olive oil	I don't know	Nutrition Label 1	no
coconut oil, sunflower oil, olive oil, corn oil	Because sugar is addictive and eating it makes you crave for more	Nutrition Label 2	No
coconut oil, olive oil	To avoid diabetes?	Nutrition Label 2	No.
coconut oil, olive oil	because its usually unnecessary and not as healthy as like the natural sugar found in the food	Nutrition Label 2	No
sunflower oil	A lot of fats.	Nutrition Label 2	Nope
sunflower oil, olive oil	Diabetes?	Nutrition Label 1	No.
coconut oil, olive oil, corn oil	They could expose underlying health problems and are also not good for you.	Nutrition Label 2	No I haven't
	it makes people fat	Nutrition Label 1	yes from you
coconut oil, sunflower oil, olive oil, corn oil	Excessive sugar leads to fatness.	Nutrition Label 2	Yes, during my sophomore summer,I served the food as part of my job at the YMCA.

coconut oil, olive oil, corn oil	Maybe because it's higher than the recommended dose	Nutrition Label 1	No I haven't
olive oil	it is unhealthy	Nutrition Label 2	No
coconut oil, sunflower oil, olive oil, corn oil	Added sugar just make adds more sugar into your bloodstream and increase weight gain as well as an increase risk for diabetes	Nutrition Label 1	No, I have not.
olive oil	Added sugar is unhealthy to someone's diet. Lot of our food already have carbohydrates and added sugar is not healthy.	Nutrition Label 2	No I have not heard of The Boston Summer Eats Program.
coconut oil, sunflower oil, olive oil, corn oil	Avoiding added sugar can decrease the risk for weight gain, heart disease, diabetes, high blood pressure, cancer, and even dementia.	Nutrition Label 2	No, I haven't heard of it.

Appendix E: Responses from *Padlet* Writing Prompts

During COVID-19, have your nutritional choices been affected by lack of access to food?	If you did not have your parents to cook for you, what do you think you would eat?
Yes, I have been eating less fresh food	I would be snacking or I'll be eating processed food like ramen or canned food. I can't cook
i have actually eaten a lot less fast food then i usually do but mostly on my weekend diet which is like a power breakfast to get me to when dinner is made	ramen noodles
since everyone is home, there's actually been more home cooked meals	I would be eating fast food, processed food all day. I don't know how to cook
Not really, I'm still eating the same types of food. But less fast food.	I would only eat fast food and Uber eats
Not necessarily by lack of access to food but I've noticed that im eating less healthy food and I'm snacking a lot. I think it's based on the fact that I'm staying at home and I don't drive so I eat smaller, quick snacks between meals	probably nothing, I actually forget to eat a lot of the time especially when I have a lot to do and by the time I remember I don't care
Yes, my food choices in terms of what is nutritional for my intake, has been limited since there is so much food shortage.	I know how to cook so I probably would cook for myself but there are times where I'm really lazy to cook so I probably would've also been eating way more junk food than usual
I've eaten less in a day	currently cook my own meals and often for my family as well so I think I would be eating a lot of the Somali food. But Somali food has a lot of oil so I need to work on balancing my foods
Yes sometimes. My family don't always have enough food to buy during this pandemic. In fact, I probably eat 2 meals everyday	i would probably make some rice and pasta with vegetables etc like earlier in the week and eat it as the week goes on making small additions etc based upon what i want at the current moment

I'm eating less fast food because you never know what that food has	Fast food
I think the biggest issue I have when it comes food is that I tend to consume a lot of fast food recently because I don't have that balance and structure that I had with school.	Before, I would go to school, play sports, and go to work and at the end of the day, I would get home and my mom would just get home at the same time and so I wouldn't want to bother her so I would order food like from McDonald's and Wendy's. I started to notice I was gaining weight in like those 3 months so I stopped eating it completely. I'm still trying my best to kind of stay away from all that
I still eat about the same things I usually do. I have realized that I eat less than what I normally do and I have not been eating out	tbh I think because the influence of my culture I would still eat cook meal, but at the same time food can still be unhealthy from all the sodium and oil
At first I felt that I was eating better with a more concise routine but it reverted and my eating routine is really bad	YESS ^ ^ ^
It's ironic because many say that this is a time to do something productive like eating healthier but I feel like staying at home makes you lack that motivation to do so	I would eat more fast food. the dollar menu anything that can get me full quick for a cheaper price

Appendix F: Nutrition with Nadjia Post Survey Responses

Survey can be found via:

https://docs.google.com/forms/d/e/1FAIpQLSfNNCQOF5wWay1kJychvaY689pg4MK86qzpNvmv2zxGHsFeMg/viewform?usp=sf_link

What did you enjoy most about the information session?	Which Oils should you have? check all that apply	What information about food and nutrition do you still want to learn about?	After this information session, do you think you will change how you shop for food?
I liked how she implemented her personal life and how she uses what she learned into her diet.	olive oil, coconut oil, avocado oil	I want to learn more about rice specifically and what kinds are healthy.	Yes
it was eye opening but mainly it was a super nice break from whats going on	olive oil, sunflower oil, coconut oil, avocado oil, palm oil	nothing really because i dont have many food concerns atm	Yes
Learning about the different ways I can eat healthier food. I also like learning about how food affects the inside of your body.	olive oil, sunflower oil, avocado oil, palm oil	I would like to learn recipes for healthier food	Yes
I enjoyed that the session was a whole new learning experience and that big words and concepts were broken down to much more simpler ones. I feel like I've sat through so much information about nutrition and health but I didn't absorb it as much. You made it really fun and interactive. Also, I liked how you made us gradually feel comfortable with participating it wasn't a forced effort	olive oil, avocado oil	I want to learn about something related but a bit different. I think it's hard to find CORRECT information on nutrition on the internet because you get so many answers from different angles. How do you know which information or sites to trust? Also, I want to learn about weight loss and gain. I've been skinny most of my life and underweight and I want to know the correct steps for that. ALSO! I want to learn how to correctly read nutrition facts. Because there's so much to read, I get overwhelmed and just put the item into my cart not knowing how much sugar it contains and etc	Yes
I really enjoyed how this information session was more interactive and personal as opposed to a lecture.	olive oil, coconut oil, avocado oil	I would like to learn more about how stress and your metabolism can play a role in your dietary habits.	I don't think I need to change what I buy (no)
I enjoyed learning more about how responsible it is in helping you fight disease and helps the immune system	olive oil	I want to learn more about lectins and how to limit them in my diet	I need more information on how to make changes

The facts in the slides and asking curious questions	olive oil	I don't have any questions at the moment but will email you if I do.	Maybe
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Responses continued...

Why is it important to avoid lectins?	Which foods should be avoided?	Suggestions for improvement if this information session was run again.
It causes stomach inflammation.	Corn, lentils	Good work!
they trigger an inflammatory response giving you some gut problems	Corn	none it was fun and enjoyable just give yourself more time because its a huge topic with questions etc think u should try and schedule 1 and a half hours to 2 hours at most
It can damage the lining of your intestines. Make things hard to digest	Corn	I think it was pretty good. I would add a cooking video or a slide is steps of how to cook a type of food.
It is important to avoid lectins because they are the most toxic chemicals out of the other two you mentioned found in food. They can cause the breakdown of the protective intestinal wall and it can cause an imbalance of good and bad bacteria that come in and come out.		Probably in the beginning, make everyone introduce themselves through unmuting themselves. I wanted to talk through my mic but because I didn't really do that in the beginning I only felt comfortable talking through chat
It's important because they tend to reduce your body's ability to absorb nutrients.	Corn	I enjoyed this information session, Nadja did a great job :)
It is important to avoid lectins due to their role in gut related problems such as gut permeability	Corn	I feel that it was a great info session and like how interactive it was.
	lentils	Not that I know of